REMARKS

Claims 1, 3-6 and 8-14 are pending and under consideration in this application. New claim 14 is added herein. Support for claim 14 may be found in claim 6 as filed originally. Reconsideration is requested based on the foregoing amendment and the following remarks.

Response to Arguments:

The Applicants appreciate the consideration given to their arguments, and the new grounds of rejection. Further favorable consideration is requested.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 3, 4, 5, 6, 8, and 10-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application No. 2002/0107835 to Coram et al. (hereinafter "Coram") in view of U.S. Patent No. 5,748,985 to Kanai (hereinafter "Kanai"). The rejection is traversed. Reconsideration is earnestly solicited.

The third clauses of claims 1 and 11 recite:

> An update condition setting unit that sets a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period.

Coram neither teaches, discloses, nor suggests "an update condition setting unit that sets a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as recited in claims 1 and 11. The final Office Action acknowledges this deficiency with respect to Coram at page 4, in the first full paragraph, and attempts to compensate for it by combining Coram with Kanai.

Kanai, however, does not show "an update condition setting unit that sets a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," either, and thus cannot compensate for this deficiency of Coram. Kanai, rather, is *storing* data (write after data) *from* the cache into the storage in the write after mode, not updating the cache memory. In particular, as described in the Abstract:

> When storing data (write after data) from the cache into the storage in the write after mode, the last update generation specified prior to when the data is first

> written in the cache is set as the update generation of the data. When an update generation is specified by the CPU, write after data having a generation older than the specified generation by a predetermined effective management generation number n or more is preferentially written in the storage.

Since Kanai is storing write after data from the cache into the storage in the write after mode, Kanai is not setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as recited in claims 1 and 11.

In the cache control of Kanai, furthermore, updated data is written in a direct access storage device *from* a cache according to a write-back mode. In particular, as described at column 2, lines 23 to 29:

> It is therefore an object of the present invention to provide a cache control method and a cache controller for use in a computer system in which updated data is written in a direct access storage device from a cache according to a write-back mode, wherein updated data lost at an occurrence of a cache failure is recovered in a short period of time and the overhead for the recovery is minimized.

Since Kanai is writing updated data in a direct access storage device from a cache, Kanai is not setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as recited in claims 1 and 11.

The checkpoints of Kanai, furthermore, are disposed in a database program at *fixed* intervals of time or each time a *predetermined* number of data update operations are accomplished. In particular, as described at column 6, lines 6 to 11:

> During execution of the database program, there are disposed a plurality of checkpoints. The checkpoints are set, for example, at a fixed interval time or each time a predetermined number of data update operations are accomplished. These points are supervised according to checkpoint (CP) identifiers.

Since the checkpoints of Kanai are disposed in a database program at a fixed interval time or each time a predetermined number of data update operations are accomplished, Kanai is not setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of

data records updated in the database within a predetermined period," as recited in claims 1 and 11.

Furthermore, in Kanai, on receiving a CP command, the controller 20 *writes* the record in the disk device 30. In particular, as described at column 6, lines 45 to 50:

> Furthermore, on receiving a CP command, the cache controller 20 conducts a record retrieval for a write-back record of an update generation G(x-n) which is advanced in time by n generations relative to an update generation G(x) related to the CP command. If the record is obtained, the controller 20 writes the record in the disk device 30.

Since, in Kanai, on receiving a CP command, the controller 20 writes the record in the disk device 30, Kanai is not setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as recited in claims 1 and 11.

Furthermore, in Kanai, the cache controller 20 *writes* the write-back record stored in the cache 25 in the magnetic disk device 30 during a period of time in which the disk device 30 is not conducting any other input/output operation. In particular, as described at column 9, lines 56 to 61:

> The cache controller 20 writes, in an asynchronous manner with respect to the data update request from the CPU 10, the write-back record stored in the cache 25 in the magnetic disk device 30 during a period of time in which the disk device 30 is not conducting any other input/output operation.

Since, in Kanai, the cache controller 20 writes the write-back record stored in the cache 25 in the magnetic disk device 30 during a period of time in which the disk device 30 is not conducting any other input/output operation, Kanai is not setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as recited in claims 1 and 11. Thus, even if Coram and Kanai were combined as proposed in the final Office Action, the claimed invention would not result. Claims 1 and 11 are submitted to be allowable. Withdrawal of the rejection of claims 1 and 11 is earnestly solicited.

Claims 3, 4, and 5 depend from claim 1 and add further distinguishing elements, while claims 12 and 13 depend from claim 11 and add further distinguishing elements. Claims 3, 4, 5,

12, and 13 are thus also submitted to be allowable. Withdrawal of the rejection of claims 3, 4, 5, 12, and 13 is also earnestly solicited.

Claims 6, 8, and 10:

The second clause of claim 6 recites:

> Setting a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period.

Neither Coram nor Kanai teach, disclose, or suggest, "setting a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as discussed above with respect to the rejections of claims 1 and 11. Claim 6 is thus also submitted to be allowable for at least those reasons discussed above respect to the rejections of claims 1 and 11.

Claims 8 and 10 depend from claim 6 and add further distinguishing elements. Claims 8 and 10 are thus also submitted to be allowable. Withdrawal of the rejection of claims 8 and 10 is earnestly solicited.

Claims 4 and 9:

Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coram in view of Kanai as applied to claims 1 and 6 above, and further in view of U.S. Patent Application No. 2006/0034267 to Torrey et al. (hereinafter "Torrey"). The rejection is traversed. Reconsideration is earnestly solicited.

Claims 4 and 9 depend from claims 1 and 6, respectively, and add further distinguishing elements. Neither Coram nor Kanai teach, disclose, or suggest, setting "a cache update condition based on a database update condition that indicates when the cache memory is to be updated, wherein the database update condition includes a number of data records updated in the database within a predetermined period," as discussed above with respect to the rejections of claims 1 and 11.

Torrey does not either, and thus cannot make up for the deficiencies of either Coram or Kanai with respect to claims 4 and 9. Claims 4 and 9 are thus also submitted to be allowable. Withdrawal of the rejection of claims 4 and 9 is earnestly solicited.

New claim 14:

Claim 14 recites:

> Setting a cache update condition based on a database update condition that indicates when the cache memory is to be updated.

None of the cited references teach, disclose, or suggest "setting a cache update condition based on a database update condition that indicates when the cache memory is to be updated," as discussed above with respect to the rejection of claim 1. Claim 14 is thus believed to be allowable, for release of those reasons discussed above with respect to the rejection of claim 1.

Conclusion:

Accordingly, in view of the reasons given above, it is submitted that all of claims 1, 3-6 and 8-14 are allowable over the cited references. Allowance of all claims 1, 3-6 and 8-14 and of this entire application is therefore respectfully requested.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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